

WHAT IS CLAIMED IS:

1. A pilot air system for providing pilot air to a combustor of a gas turbine wherein the system comprises:

an inlet to receive a portion of compressed air discharged by a compressor of the gas turbine, wherein the portion of the compressed air is pilot air;

a main passageway coupled to the inlet and providing a flow passage for the pilot air;

an inline throttling valve coupled to the main passageway and metering a pressure of the compressed air in the main passageway;

a pilot air compressor in series with the main passageway;

a by-pass passageway for the pilot air and arranged in parallel to the main passageway and compressor, wherein said by-pass passageway receives pilot air from the main passageway downstream of the pilot air compressor and passes a portion of the compressed pilot air to the main passageway upstream of the pilot air compressor;

a by-pass throttling valve inline with said by-pass passageway to meter pilot air flowing through said by-pass passageway, and

said main passageway having an outlet connectable to said combustor.

2. A pilot air system as in claim 1 further comprising a heat exchanger in series with said main passageway downstream of the inlet and upstream of the pilot air compressor.

3. A pilot air system as in claim 2 wherein said heat exchanger is an adjustable heat exchanger and further comprises a variable speed fan and a radiator in series with said main passageway.

4. A pilot air system as in claim 2 further comprising a controller regulating a pressure of the pilot air at the outlet by adjusting the heat exchanger.

5. A pilot air system as in claim 1 further comprising a moisture separator in series with said main passageway.

6. A pilot air system as in claim 1 further comprising a butterfly valve in series with said main passageway.

7. A pilot air system as in claim 1 wherein said inline throttling valve is a first and second throttling valve in a parallel arrangement.

8. A pilot air system as in claim 1 wherein said outlet is connectable to a pilot air manifold of said combustor.

9. A pilot air system as in claim 1 wherein said throttling valves adjust an increases in pilot air pressure such that a pressure of the pilot air at the

outlet is in a range of 1.00 to 1.50 of the pilot air pressure at the inlet.

10. A pilot air system as in claim 1 wherein said throttling valves adjust an increases in pilot air pressure such that a pressure of the pilot air at the outlet is in a range of 1.05 to 1.25 of the pilot air pressure at the inlet.

11. A pilot air system for providing pilot air to a combustor of a gas turbine wherein the system comprises:

a main pilot air main passageway having an inlet adapted to receive compressed air discharged by a compressor of the gas turbine;

a pilot air compressor coupled to said main passageway to boost pilot air in said passageway;

a first throttling valve in said main passageway and inline with said compressor;

a by-pass passageway having an inlet joined to said main passageway downstream of the compressor and an outlet joined to said main passageway upstream of the compressor;

a by-pass throttling valve coupled to said by-pass passageway, and

an outlet connectable to the combustor of the gas turbine.

12. A pilot air system as in claim 11 further comprising a heat exchanger coupled to said main passageway downstream of the inlet and upstream of the compressor.

13. A pilot air system as in claim 12 wherein said heat exchanger further is an adjustable heat exchanger and further comprises a variable speed fan and a radiator inline with said main passageway.

14. A pilot air system as in claim 12 further comprising a controller regulating a temperature of the pilot air by adjusting the heat exchanger.

15. A pilot air system as in claim 11 further comprising a moisture separator in said main passageway.

16. A pilot air system as in claim 11 further comprising a butterfly valve in said main passageway.

17. A pilot air system as in claim 11 wherein said first and second throttling valves are in a parallel arrangement.

18. A pilot air system as in claim 11 wherein said second pipe outlet is connectable to a pilot air manifold of said combustor.

19. A pilot air system as in claim 11 wherein said throttling valves adjust an increases in pilot air pressure such that a pressure of the pilot air at the outlet is in a range of 1.00 to 1.50 of the pilot air pressure at the inlet.

20. A pilot air system as in claim 11 wherein said throttling valves adjust an increases in pilot air pressure such that a pressure of the pilot air at the outlet is in a range of 1.05 to 1.25 of the pilot air pressure at the inlet.

21. A method for providing pilot air to a combustor of a gas turbine comprising:

directing a portion of compressed air from a discharge of a compressor in the gas turbine to a pilot air main passageway, wherein said air in the main passageway is pilot air;

directing another portion of the compressor discharge air directly into the combustor;

boosting pressure of the pilot air with a pilot air compressor in the main passageway;

providing a by-pass passageway coupled to the main passageway both downstream and upstream of the pilot air compressor directing a portion of the compressed pilot air in the main passageway, and

regulating the pressure of the pilot air at the combustor by at least one throttling valve in the main passageway and a by-pass throttling valve in the by-pass passageway.

22. A method for providing pilot air as in claim 21 further comprising:

cooling the pilot air upstream of the pilot air compressor to a predetermined pilot air temperature.

23. A method for providing pilot air as in claim 22 further comprising:

selecting the predetermined pilot air temperature to achieve a desired pressure of the pilot air at the combustor.

24. A method for providing pilot air as in claim 22 further comprising:

selecting the predetermined pilot air temperature to achieve a desired pressure ratio the pilot air at the combustor to the compressed air at the compressor discharge.